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SOME STUDIES ON THE FINANCING OF PUBLIC SCHOOLS IN FOURTEEN GREAT CITIES OF THE UNITED STATES

by

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Introduction

This paper is a review of a series of studies which the writer has conducted for a group of the great city school systems from 1960 to the present time.

The group consists of fourteen systems which, under the leadership of Dr. Benjamin C. Willis, banded together some eight years ago to study problems of mutual concern and interest. An organization known as the Research Council of the Great Cities Program for School Improvement was created in 1962 to conduct studies and to develop regular communication among members in various areas including finance.

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THE FIRST PROJECT ON FISCAL POLICIES

This project was conducted to get the basic facts that might be helpful to improve the fiscal policies for the great city school systems. Leaders in those systems sensed an impending crisis of unprecedented size. They were fighting a losing battle of matching revenue with educational needs. By 1960 evidence was mounting to show the necessity for emergency action to remedy the situation.

Thus, the first project which I undertook was concerned with finding out what fiscal policies were necessary to forestall disaster and to put these systems in a position of strength. The first task was to get the facts about the state of affairs. The second one was to find out what changes in policies might be inferred from the facts. There were four questions to be answered:

1. What are the financial needs to meet the educational task of the great city school systems?
2. What is the revenue potential to meet those needs?
3. What are the sources of revenue and the limitations on access to the sources?
4. How does the access of the public school system to the revenue sources compare with other local government?

Financial Needs

The financial needs of current operating expenses and capital outlay were estimated for the five-year period from 1960 to 1965. This period was chosen for three reasons. First, some of the systems were running out of money and such an estimate would indicate the time for anticipating retrenchments or for finding additional revenue sources. Second, the solution to the fiscal problem seemed to require the setting of a minimum span of time for initial action toward implementing

a fiscal policy of long-range significance. Five years seemed to be a reasonable period to make reasonably accurate estimates for specific changes. The selection of this period did not preclude the necessity for longer range planning of buildings, general goals and other aspects of the school system. Third, an intensive five-year estimate was believed to offer a basis for clarifying broad, long-term policies which necessarily require periodic evaluation.

Financial needs have to be estimated in terms of the costs of staff, buildings and facilities to operate given programs and services for a particular school population. In this instance a minimum of 50 professionals per 1000 pupils was chosen as a standard. This was not considered to be an adequate criterion but a feasible goal to accomplish in five years if adequate funds were available.

An alternative estimate was prepared for comparative purposes. This was merely a projection of the financial posture of 1960. The average pupil-staff ratios, average salaries and other expenses of 1960 were applied to projected enrollments from 1960 to 1965. Additional capital outlay was estimated on the basis of pupil-staff ratios in 1960.

Both of these standards were used to project operating and capital expenses. The actual pupil-staff ratios of 1960 were chosen to show whether or not sufficient funds would be available from sources available in that year to accommodate increasing enrollment, without any consideration for many needed improvements in salary policies, materials of instruction and housing.

The trend of pupil membership in most of the great cities was upward, and moving at a faster rate than revenue. Table 1 shows the trend of these enrollments. This estimate was also the basis for projecting numbers of professional staff members as shown in Table 2.

TABLE 1

PUPIL MEMBERSHIP

PUBLIC ELEMENTARY AND HIGH SCHOOLS

City	ACTUAL		ESTIMATED				
	1950 (1)	1960 (2)	1961 (3)	1962 (4)	1963 (5)	1964 (6)	1965 (7)
Baltimore	114,151	160,043	163,304	165,083	167,392	169,718	172,015
Boston	86,701	85,424	84,874	84,600	84,355	83,693	83,127
Buffalo	61,951	64,250	65,136	66,016	66,716	67,616	68,316
Chicago	360,243	460,479	485,193	516,731	533,409	545,545	555,403
Cleveland	96,071	127,073	130,725	134,100	137,550	141,001	144,401
Detroit	220,380	271,135	272,936	275,197	281,963	280,634	281,572
Los Angeles	307,856	504,188	525,903	552,689	577,966	604,134	626,614
Milwaukee	64,095	96,421	99,958	104,392	108,745	112,607	115,514
New York	854,342	950,690	962,263	969,579	978,541	986,502	993,713
Philadelphia	206,201	230,553	235,830	248,800	250,300	254,000	255,600
Pittsburgh	66,520	69,817	69,783	70,233	70,682	70,334	70,028
St. Louis	80,693	95,097	97,188	98,998	101,084	102,683	103,703

Note: These figures are expressed as full-time equivalents of all pupils enrolled in full-time and part-time programs in the elementary and high school grades. The figures represent the maximum pupil membership in full-time equivalents at any given time during the budget year.

TABLE 2

PROFESSIONAL STAFF

City	1950		1960		1965	
	Actual Number (1)	Number Staff Per 1000 Pupils (2)	Actual Number (3)	Number Staff Per 1000 Pupils (4)	Estimated Number (5)	Number Staff Per 1000 Pupils (6)
Baltimore	4,452	39.0	6,367	39.8	6,843	39.8
Boston	3,916	45.2	3,644	42.7	3,550	42.7
Buffalo	3,061	49.4	3,015	46.9	3,206	46.9
Chicago	12,451	34.6	18,360	39.9	22,145	39.9
Cleveland	3,595	37.4	4,834	38.0	5,493	38.0
Detroit	7,870	35.7	10,873	40.1	11,291	40.1
Los Angeles	12,268	39.8	19,192	38.1	23,853	38.1
Milwaukee	2,564	40.0	4,002	41.5	4,810	41.6
New York	34,858	40.8	42,946	45.2	44,890	45.2
Philadelphia	8,321	40.4	9,647	41.8	10,697	41.9
Pittsburgh	2,554	38.4	2,665	38.2	2,673	38.2
St. Louis	2,797	34.7	3,713	39.0	4,051	39.1

Notes: Numbers of staff members are expressed as full-time equivalent budgeted positions.

Estimates for 1965 are based on the 1960 pupil-staff ratios.

The projection of expenditures and revenues by 1965 revealed what many leaders feared. Nine of the twelve cities would run short of operating funds to maintain the status quo of 1960 unless they could find new sources of revenue or unless the limits on existing sources were raised. These figures are shown in Table 3.

In every case expenditures were estimated to rise. The lowest amount above the 1960 budget was 7.5 per cent in Baltimore and the highest was 39.4 per cent in Milwaukee. If each city could organize its programs with an average of 50 professionals per 1000 pupils the increase would range from 22.3 to 61.5 per cent.

Revenue Potential

No city in this group had an assured revenue potential to maintain operations in effect in 1960 for anticipated enrollments up through 1965. Only three of these systems could maintain their status quo level of current operating expenses over this five-year period. Nine systems would have deficits. All would have deficits if the higher level of staffing were in effect.

The needs for additional capital outlay to accommodate increased enrollments were large, as shown in Table 4. Estimates ranged from 18 millions of dollars in Cleveland to 728 millions in New York City just to maintain the pupil-staff ratios of 1960. The higher standard of staffing required amounts estimated to range from 37.9 millions in Buffalo to 1,026.5 millions in New York City.

Table 5 shows the relationship between expenditure and revenue needs. These estimates do not include the vast needs for replacements and renovations of existing buildings. When the total amounts are distributed over the five-year period and related to the applicable revenue, the deficiencies in capital revenue are obvious. No city in this group had enough applicable revenue to complete the amortization of its bonded indebtedness as of 1960 and accommodate its anticipated enrollments at the 1960 staffing standards.

TABLE 3

ESTIMATED INCREASES IN ANNUAL CURRENT EXPENSES AND REVENUE POTENTIAL FROM 1960 to 1965
(in millions)

City	Current Expenditures					Revenue			
		1960 Staff Ratios		50 Prof. Staff Per 1000 Pupils					
	1960 Actual (1)	1965 Estimates (2)	Per Cent Increase Over 1960 Actual (3)	1965 Estimates (4)	Per Cent Increase Over 1960 Actual (5)	1960 Potential (6)	1965 Potential[2] (7)	Surplus or Deficit for 1965 (1960 Staff Ratios) (8)	Surplus or Deficit for 1965 (50 Prof. Staff per 1000 Pupils) (9)
Baltimore[1]	$ 62.0	$ 66.6	7.5%	$ 81.2	46.0%	$ 62.0	$ 62.0	$ -4.6	$ -19.2
Boston[1]	32.2	34.7	7.8	39.4	22.3	21.2	21.2	-13.5	-18.2
Buffalo[1]	27.7	36.0	29.8	38.0	37.1	27.6	27.6	-8.4	-10.4
Chicago	202.6	252.8	24.8	310.0	53.0	202.6	227.8	-25.0	-82.2
Cleveland	49.3	56.3	14.2	71.7	45.5	49.0	55.3	-1.0	-16.4
Detroit	119.1	131.8	10.7	160.6	34.8	119.1	131.8	0.0	-28.8
Los Angeles	215.4	267.7	24.3	343.5	59.4	228.8	295.6	27.9	-47.8
Milwaukee	39.9	55.6	39.4	64.4	61.5	49.1	60.5	4.9	-4.0
New York[1]	462.0	573.3	24.1	631.0	36.6	402.0	462.0	-111.0	-169.0
Philadelphia	96.8	107.3	10.9	128.7	33.0	96.0	106.7	-0.6	-22.0
Pittsburgh	29.0	31.3	7.6	38.9	34.0	27.9	27.9	-3.4	-11.0
St. Louis	33.2	41.9	26.5	52.5	58.3	34.4	38.1	-3.8	-14.4

[1] Fiscally dependent upon Municipal government or County government.

[2] Based on legalized sources operative in 1960 or at the time of preparing this report.

Note: These estimates are based on 1960 prices and do not include any allowances for inflation or deflation. They should not be interpreted as recommended alternatives. They merely show bases from which actual needs in each city may be estimated. The estimates based on 50 professionals per 1000 pupils are believed to represent a defensible minimum but not necessarily adequate amounts.

TABLE 4

ESTIMATED COST OF CAPITAL OUTLAY FOR

CUMULATIVE NEEDS 1961 through 1965
(in millions)

City	Capital Needs at 1960 Pupil-Staff Ratio			Capital Needs for 50 Professionals per 1000	
	Amount (1)	Amount to be Paid from Current Revenue (2)	Net Amount to be Financed by Bonded Debt (3)	Amount (4)	Net Amount to be Financed by Bonded Debt (5)
Baltimore	$ 55.8	$ 2.5	$ 53.3	$ 118.3	$ 115.7
Boston	32.9	29.3	3.6	38.5	9.2
Buffalo	35.9	3.8	32.2	37.9	34.2
Chicago	332.0	70.0	262.0	500.8	430.8
Cleveland	18.0	22.9	0.0	88.5	65.6
Detroit	95.0	35.0	60.0	172.9	137.9
Los Angeles	199.0	--	199.0	580.3	580.3
Milwaukee	40.4	6.2	34.3	44.1	37.9
New York	728.5	--	728.5	1,026.5	1,026.5
Philadelphia	60.0	0.0	60.0	100.0	100.0
Pittsburgh	30.0	0.0	30.0	64.3	64.3
St. Louis	27.7	--	27.7	84.4	84.4

TABLE 5

ANNUAL EXPENDITURES AND REVENUE FOR CAPITAL OUTLAY
(in millions)

City	Actual 1960		Estimated 1965 — 1960 Pupil-Staff Ratios				50 Prof. Per 1000 Pupils		
	Debt Service (1)	Capital Improvements (2)	Annual Payments on 1960 Debt (3)	Annual Capital Improvements (4)	First Annual Payment on 1961-65 Net Cumulative Capital Needs (5)	Total Annual Payments (6)	First Annual Payment on 1961-65 Net Cumulative Capital Needs (7)	Total Annual Payments[1] (8)	Applicable Revenue (9)
Baltimore	$ 5.0	$ 9.8	$ 7.5	$12.5	$ 3.8	$ 23.7	$ 8.1	$ 28.1	$ 2.3
Boston	0.9	1.3	1.0	1.3	0.3	2.5	0.7	2.9	--
Buffalo	2.4	0.1	0.0	0.0	2.3	2.3	2.4	2.4	--
Chicago	16.6	9.6	15.5	14.0	18.4	47.9	30.3	59.8	15.5
Cleveland	0.0	0.8	0.0	0.8	0.0	0.8	4.6	5.4	0.0
Detroit	--	5.5	3.8	5.0	4.2	13.0	9.7	18.5	5.0
Los Angeles	30.9	62.0	28.6	49.8	14.0	92.4	40.8	119.2	27.9[2]
Milwaukee	4.2	2.5	5.0	3.0	2.4	10.4	2.7	10.7	1.3
New York	85.0	16.0	85.0	10.0	51.3	146.3	72.2	167.2	70.0
Philadelphia	8.2	10.0	9.6	12.0	4.2	25.8	7.0	28.6	0.0
Pittsburgh	1.6	0.5	2.3	0.9	2.1	5.3	4.5	7.7	3.2
St. Louis	1.9	0.4	1.9	0.5	1.9	4.3	5.9	8.3	0.0

[1] Including columns 3 and 4.

[2] If current operating expenses are limited to estimate based on 1960 pupil-staff ratio.

Note: The annual payments shown in columns 5 and 7 are based on 20-year amortization of equal annual payments with 3½ per cent interest.

These school systems clearly faced problems which demanded quick action. By very conservative standards they were facing a period of fiscal bankruptcy to provide for expanding school populations, to improve the relative economic status of teachers, and to establish a program for removing the critical capital deficiencies. A summary of estimated deficiencies in revenue for current operating expense and capital outlay is shown in Table 6.

At this writing these systems are preparing 1965 budgets. I do not know whether their fiscal posture is better or worse than in 1960. I think some are worse and others are barely holding their own. I doubt that a single one is substantially in better condition.

Sources of Revenue

What are the explanations for the critical financial deficiencies of these school systems? There are several postulations which are commonly advanced. For example, one is that the public demand for education may not be sufficiently strong to call forth appropriate revenue reforms. Another one is that the demand is not communicated effectively through the structures of government for solutions to the problem. No one knows the absolute amount of the economic productivity that could be--or that should be--allocated to education.

Granted that we need more knowledge about such propositions, there are two fundamental conditions that seem to be necessary to solve the aforementioned fiscal deficiency. The first one requires that the public school systems must be given broad access to tax sources which are responsive to the economic capability in each respective state, and in the nation as a whole. The second condition requires that the access be utilized. A balanced tax structure may satisfy the principle of equity among tax payers and yet fail to meet a test of adequacy to support given educational needs.

TABLE 6

LIMITATIONS ON REVENUE SOURCES[1] TO MEET ESTIMATED EXPENSES IN 1965

(Expressed as Estimated Surplus or Deficit in Tax Sources in Millions)

City	Current Operating Expense		Capital Outlay	
	At 1960 Pupil-Staff Ratios (1)	At 50 Prof. Staff Per 1000 Pupils (2)	At 1960 Pupil-Staff Ratios (3)	At 50 Prof. Staff Per 1000 Pupils (4)
Baltimore	$- 4.6	$- 19.2	$- 21.4	$- 25.8
Boston	- 13.5	- 18.2	- 2.5	- 2.5
Buffalo	- 8.4	- 10.4	- 2.3	- 2.4
Chicago	- 25.0	- 82.2	- 32.4	- 44.3
Cleveland	- 1.0	- 16.5	- 0.8	- 5.4
Detroit	0.0	- 28.8	- 8.0	- 13.5
Los Angeles	27.9	- 47.8	- 64.5	-119.2
Milwaukee	4.9	- 4.0	- 9.1	- 9.4
New York	-111.0	-169.0	- 76.3	- 97.2
Philadelphia	- 0.6	- 22.0	- 25.8	- 28.6
Pittsburgh	- 3.4	- 11.0	- 2.1	- 4.5
St. Louis	- 3.8	- 14.4	- 4.3	- 8.3

[1] Assuming full utilization of sources applicable in 1960 and increased appropriations from other local government in fiscally dependent systems to meet the estimates of expenditure needs.

Positive numbers indicate amount of surplus or unneeded tax leeway.
Negative numbers indicate amount of deficit in the local revenue sources.

In the project which I am discussing, we made some inquiry about the access of the city school systems to the principal tax sources within their respective states.

The three categories of tax sources were property, transactions (business and consumer), and income. All of these cities except New York received more than half of their revenue from local property tax. This base contributed heavily to the support of local non-educational government.

The relative standing of the cities in their respective states in terms of the major tax sources and school enrollments are shown in Table 7. These figures indicate that generally the school systems have been saddled on the tax base of their lowest relative ability in the state.

The question was posed, how does the access of the public school system to revenue sources compare with local non-educational government? Distributions of revenue by sources for these two types of local government are shown in Tables 8 and 9. In every instance except Detroit local non-educational governments have been given broader access to revenue sources than have the public school systems. Some of the cost of non-educational functions has been shifted to non-tax revenue. This comparison, of course, in no way implies anything about the adequacy of support for either one of these types of governmental functions.

Given the specific facts of this study and the large amount of common knowledge about taxes, it is reasonable to make some conclusions about the general solution to the fiscal problem of these school systems. The first fundamental step is to give them access to additional avenues of principal tax sources. The second one is to remove some of the unnecessary fiscal controls on the administration of tax sources and management of funds which are already available to the school systems.

TABLE 7

INDEXES OF TAX ABILITY

1958

City's Share as a Percent of State Totals

City	Net Day School Enrollment	Equalized Assessed Property Valuation	Net Effective Buying (1) Income (5)	Total Retail (5) Sales (8)	Personal Income
Baltimore	28.7%	31.7%(7)	32.7%	40.0%	28.8%
Boston	10.8	14.9	15.0	21.0	--
Buffalo	2.6	3.1 (4)	3.3	3.7	--
Chicago	30.2	30.9	41.6	42.0	42.8 (4)
Cleveland	7.4	10.8	10.7	12.7	13.6 (3)
Detroit	17.0	22.8	27.3	24.6	--
Los Angeles	15.9	19.7	18.0	19.0	--
Milwaukee	14.5	20.0	22.3	24.1	22.3 (1) (5)
Philadelphia	12.5	28.6 (5)	20.0	19.3	19.5
Pittsburgh	3.8	8.3 (5)	6.6	7.6	6.6 (1) (5)
St. Louis	17.5	18.4 (6)	22.7	21.6	--

(1) Sales Management, July 10, 1960, pp. 19-379.
(2) Not equalized.
(3) Estimated.
(4) 1958.
(5) 1959.
(6) Missouri State Tax Commission, Annual Report.
(7) Maryland Leg. Council, Committee on Taxation and Fiscal Affairs, 1959 Report.
(8) Sales Management, July 10, 1960, pp. 463-710.

TABLE 8

REVENUE FOR LOCAL EDUCATION - COLLECTED BY ALL LEVELS OF GOVERNMENT[1]

- In Twelve Cities -

1957

City	Revenue Source (in thousands)					Percent of All Level Total			
	1. Charges and Misc. Non-Tax	2. Property (Real & Personal) Tax	3. Transactions (Business & Consumer) Tax	4. Income (Ind. & Corporate) Tax	Total All Levels	1.	2.	3.	4.
Baltimore	$ 2,493	$ 38,382	$ 12,212	$ 2,594	$ 55,681	4.5%	68.9%	21.9%	4.7%
Boston	1,496	29,013	3,526	1,462	35,497	4.2	81.7	9.9	4.1
Buffalo	1,118	20,730	4,019	2,073	27,940	4.0	74.2	14.4	7.4
Chicago	8,168	176,401	31,069	--	215,638	3.8	81.8	14.4	--
Cleveland	1,701	34,978	5,949	--	42,628	4.0	82.0	14.0	--
Detroit	6,798	70,613	47,522	--	124,933	5.4	56.5	38.1	--
Los Angeles	13,534	131,276	52,308	13,780	210,898	6.4	62.2	24.8	6.6
Milwaukee	3,760	32,518	7,610	7,437	51,325	7.3	63.4	14.8	14.5
New York	17,957	224,481	180,024	71,742	494,204	3.6	45.5	36.4	14.5
Philadelphia	4,017	54,703	26,909	4,797	90,426	4.4	60.5	29.8	5.3
Pittsburgh	1,446	16,584	8,262	1,013	27,305	5.3	60.7	30.3	3.7
St. Louis	2,173	23,419	6,882	1,216	33,690	6.4	69.6	20.4	3.6

[1] Earmarked and allocated.

TABLE 9

REVENUE FOR LOCAL NON-EDUCATIONAL FUNCTIONS - COLLECTED BY ALL LEVELS OF GOVERNMENT

- In Twelve Cities -

1957

City	Revenue Source (in thousands)					Percent of All Level Total			
	1. Charges and Misc. Non-Tax	2. Property (Real & Personal) Tax	3. Transactions (Business & Consumer) Tax	4. Income (Ind. & Corporate) Tax	Total All Levels	1.	2.	3.	4.
Baltimore	$ 21,591	$ 48,483	$ 34,111	$ 12,624	$ 117,809	18.3%	42.0%	29.0%	10.7%
Boston	16,012	86,437	25,268	12,730	140,447	11.4	61.5	18.0	9.1
Buffalo	8,675	28,427	4,609	2,478	44,189	19.6	64.3	10.4	5.6
Chicago	32,763	117,714	136,053	2,385	288,915	11.3	40.7	47.2	0.8
Cleveland	17,693	48,004	13,069	909	79,675	22.2	60.2	16.5	1.1
Detroit	39,513	124,865	31,739	1,335	197,452	20.0	63.2	16.1	0.7
Los Angeles	48,445	68,205	70,747	4,347	191,744	25.3	35.6	36.9	2.2
Milwaukee	13,263	28,698	12,246	10,410	64,617	20.5	44.4	19.0	16.1
New York	277,364	643,174	440,823	133,333	1,494,694	18.6	43.0	29.5	8.9
Philadelphia	44,605	80,149	34,284	66,744	225,782	19.8	35.5	15.2	29.5
Pittsburgh	3,983	26,530	8,104	6,171	44,788	8.9	59.2	18.1	13.8
St. Louis	11,718	28,166	18,268	10,350	68,502	17.1	41.1	26.7	15.1

This initial project which I have just described provided sufficient facts, in the opinion of superintendents and board members in these cities, to aid in the preparation of a position paper on fiscal policies. Hence, I was asked to prepare with the assistance of representatives, a statement of the fiscal problem and policies which might serve as guides for a solution to the fiscal needs of the great city school systems. A report was prepared and submitted to the Board of Directors of the Research Council of the Great Cities Program for School Improvement. This body published the document under the title Fiscal Policies to Meet the Needs of the Great City School Systems in America. This document is available from the Research Council, 228 North LaSalle Street, Chicago, Illinois.

There are eight policy statements in this report. They might be called principles of finance which serve as guides to development of specific policies in a state. I shall not attempt to quote these statements but I do want to repeat the summary which provides a link to the chain of thought that I shall continue in this paper.

> These policies call for dynamic participation of all levels of government in supporting public education; these policies permit citizens complete access to their true economic ability; and finally, they provide for the equalization of tax burden for the support of public education. A summary of these policies may be stated in a general formula as follows:
>
> | | | | | | | |
> |---|---|---|---|---|---|---|
> | Total Cost of Budgetary Needs (Operating and capital budgets) | = | Share from Local Sources | + | Share from State Sources | + | Any Needed Share from Federal Sources |
>
> The basic principles for determining amounts of funds for each of the elements in this formula are:
>
> Total Cost of Budgetary Needs. The estimation and justification of fiscal needs are the responsibility of the local board of education. Conditions for providing educational programs of excellence are complex and variable among school districts.

Provision should be made in the budgetary costs for proper allowance of all essential components of the educational program.

Share from Local Taxes. The local share of costs should constitute that proportion of the total budget which can be supported from the local tax base in accordance with ability. A fair tax burden on the local tax base should include the burden of support on this base from non-educational functions of government.

Share from State Taxes. The state share, indicated in the formula, should be in proportion to the extent to which the prescribed burden on the local tax base is utilized. The state should set minimum and maximum percentages for sharing in the cost of local budgets. A minimum percentage would provide some state funds to the districts of highest ability. A maximum percentage would set the limit of equalization to the districts of lowest ability.

Share from Federal Taxes. The share from federal sources should support those programs which are in the national interest and should also supplement the state and local shares in relation to unmet financial needs.

The key to what follows in this paper is found in the concept "Total Cost of Budgetary Needs (operating and capital budgets)." Several students of school finance have conducted studies which in one way or another have purported to throw some new light on the structure of educational costs. Some of these have been concerned with structural characteristics which are applicable to state and federal aid formulas. Others have been more applicable to local administration as knowledge for use in internal allocation and justification of expenditures.

For some time leaders in education have been facing increasing difficulty in justifying local budgets and presenting statistics persuasively to legislative bodies for additional state aid. One reason for this, I believe, lies in the fact that the complexity of education has outrun our knowledge of the inherent structure of educational costs. Our system of accounting does not record financial allocations by functional components of the educational program. Hence we cannot show a

distribution of financial inputs by functional components from which measures of outputs can be developed.

These great city school systems provided a special group to extend my investigation of the structure of educational costs which I had under way at that time in a sample of school systems in Illinois ranging in total population from 2,500 to 125,000.

THE SECOND PROJECT:
SOME DETERMINANTS OF EDUCATIONAL COSTS

Leaders in the great city school systems have asserted that their financial plight is accentuated by necessary sur-charges or extra costs for special programs of various types. Nearly half of the pupils in these systems require more than a normal complement of staff and materials for their maximum learning and development. The argument goes that unless sufficient revenue is available to meet the extra costs that are associated with a deviate school population the great city school systems suffer in their competitive position with other systems to maintain comparable standards of performance.

Preliminary estimates of extra costs for certain programs which could be identified for counting time of pupils and staff were made in the first project. For example, an estimated seven per cent of operating expenses was spent in 1960 on programs for mentally and physically handicapped pupils, for socially maladjusted pupils, for special vocational training centers, and for Americanization classes. This estimate was only a beginning since it involved programs in which full-time pupils could be readily counted.

A further illustration of this problem can be shown in the estimates of extra staff members needed for special programs and services. Leaders claimed that any standard such as the oft-asserted one of 50 professionals per 1000 pupils would shortchange the great cities in relation to other types of school systems. Our preliminary estimates of staff members which were needed for certain programs are shown in Table 10. The numbers range from 2.4 to 23.8 per 1000 pupils. Staff members in these programs serve about one-third as many students as the staff in the so-called regular programs. Thus, about two-thirds of these persons are extras who are employed to meet the incidence of deviate pupil needs.

TABLE 10

PROFESSIONAL STAFF DEVOTED TO SPECIAL PROGRAMS

(Full-Time Equivalents)

1965 Estimated

City	Maladjusted		Vocational		American-ization		Culturally Deprived		Academically Talented		Other Programs		Totals	
	Number (1)	Ratio per 1000 Pupils (2)	Number (3)	Ratio per 1000 Pupils (4)	Number (5)	Ratio per 1000 Pupils (6)	Number (7)	Ratio per 1000 Pupils (8)	Number (9)	Ratio per 1000 Pupils (10)	Number (11)	Ratio per 1000 Pupils (12)	Number (13)	Ratio per 1000 Pupils (14)
Baltimore	635	3.7	279	1.6	1	N	1562	9.1	97	0.6	66	0.4	2640	15.3
Boston	183	2.2	101	1.2	8	0.1	239	2.9	0	0.0	258	3.1	789	9.5
Buffalo	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chicago	1560	2.8	966	1.7	58	0.1	2438	4.4	1890	3.4	256	0.5	7168	12.9
Cleveland	193	1.3	168	1.2	0	0.0	0	0.0	118	0.8	0	0.0	478	3.3
Detroit	722	2.6	383	1.4	20	0.1	34	0.1	46	0.2	0	0.0	1205	4.3
Los Angeles	940	1.5	67	0.1	0	0.0	87	0.1	380	0.6	0	0.0	1474	2.4
Milwaukee	300	2.6	0	0.0	0	0.0	15	0.1	120	1.0	0	0.0	435	3.8
New York	1796	1.8	1242	1.2	0	0.0	1507	1.5	0	0.0	0	0.0	4545	4.6
Philadelphia	1785	7.0	490	1.9	35	0.1	2985	11.7	700	2.7	85	0.3	6080	23.8
Pittsburgh	283	4.0	172	2.5	4	N	616	8.8	37	0.5	249	3.6	1361	19.4
St. Louis	400	3.9	275	2.7	0	0.0	150	1.4	0	0.0	0	0.0	825	8.0

Note: N = Negligible.

In my opinion the figures in Table 10 are under-estimates. It was not possible to apply this measure of program analysis in every school system with complete assurance because of the variation in organization of instruction and deployment of staff. I am confident that the figures of Baltimore, Chicago, Philadelphia and Pittsburgh are more realistic than the others. But I think even they are too low. The average is perhaps closer to 18 or 20 staff per 1000 pupils. The "extra" number is at least 13 per 1000 pupils.

I would guess that the number of "extra" staff in the "typical" school system would be about 3 staff per 1000 pupils. Thus the cities have a justifiable differential of about 10 staff per 1000 pupils as compared with most suburban and middle-size cities. Therefore, the standard of 50 professionals per 1000 pupils would only enable the great cities to staff the "regular" programs at about 40 per 1000 as compared with a ratio of about 47 by their closest competitors, the suburbs.

Before leaving this preliminary consideration of extra costs, let me emphasize that I was trying first to get a measure of the most visible and easily counted components. The more difficult problem still is to get a measure of the over-riding cost of masses of pupils who receive part-time special instruction in remedial classes and counseling service for retardation and maladjustment of a pervasive character. Whether this approach of program analysis will lead to a better measurement of cost remains to be seen. But it does lead to a discussion of my second project.

I started the second project with the assumption that the composition of the student population is the most fundamental phenomenon which determines the make-up of costs of education. If enough facts are known about pupils, I assumed, it may be possible to estimate the kinds of instruction, counseling, and other experiences necessary for them, together with requirements of staff and physical resources.

I explored data which might yield measures of pupil characteristics such as degree of retardation in various areas of learning, incidence of emotional maladjustment as revealed by available information, over-ageness in relation to grade level, proportion of high school graduates attending college, proportion of enrollees dropping out of school, and transiency of pupils moving from one school to another. A vast amount of information was available on these matters which seemed to be related to costs. However, it was not possible to develop a formulation of variables for predictive purposes. Thus I abandoned the search for a method of predicting extra costs directly from pupil characteristics.

I next turned attention to the high schools where it is believed the high cost of education contributes measurably to the fiscal problem of the great cities. The cities have a high proportion of students who will not continue formal education beyond high school. Hence, a high proportion of these students need some special vocational training which is more expensive than regular academic instruction. I proceeded on the original assumption but with two approaches.

The first one was to categorize schools by three types, vocational, technical, and academic and compare average per capita expenditures. The average current operating expense per pupil in a sample of 26 schools was respectively $594, $486, and $467 for these three types. This approach might be termed inter-school analysis to determine appropriate differentials in unit costs between schools of different types. This approach assumes that the typology of schools reflects differences in programs which are designed to meet the needs of students. Thus extra costs associated with types in relation to a given standard could be aggregated for a school system. If one system has a deviate school population there would be a preponderance of one type as compared with the standard.

The second approach was an intra-school analysis of costs. The procedure was to distribute salary payments of the professional staff among eight instructional areas and one category including all non-teaching professional services such as administration and counseling. Only salaries were prorated since other expenditures could not be distributed. The distributions of pupil enrollments, staff time and staff salaries are summarized in Table 11.

The area of vocational-practical arts stands out above all others in proportion of student instructional load, proportion of all professional salary payments, and average cost per student enrollee. This area adds an estimated 17 per cent to the basic cost of salaries for the teaching staffs in this sample of schools. The range among schools in the sample is from none to 57 per cent.

This analysis has not been extended to the total high school population of each city. I do not know, therefore, whether this sample is representative, though it was selected as carefully as possible for this purpose. Even if it were, I am quite certain that the proportion of instructional load in vocational-practical arts would be much higher if programs were available for all students who might choose additional work in this area.

Comparative analyses are going forward in samples of various types of school districts in Illinois, the suburb, the medium size composite city, and the village-centered rural district. Blake[1], in a recent doctoral study, examined a sample of Chicago suburban high schools. He found an average of 3.9 per cent extra cost added by vocational-practical arts work.

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[1] Blake, Roy F. An Analysis of Instructional Costs in Twenty Chicago Suburban Area High School Districts. Unpublished Doctor of Education Thesis. University of Illinois, Urbana, 1964.

TABLE 11

SUMMARY OF DISTRIBUTIONS BY INSTRUCTIONAL AREAS
IN 26 SELECTED HIGH SCHOOLS OF TEN CITIES
1961-1962

	Per Cent of Student Enrollments	Proportion of Total Professional Salaries	Average Number Students per Teacher	Average Salary per Full-time Staff	Average Salary Expenditure per Enrollee
English (Language Arts)	16.5%	14.7%	140	$6,882	$49
Social Studies	12.7	10.6	148	7,046	48
Foreign Languages	9.0	6.5	133	7,115	54
Science	10.6	10.1	132	7,018	54
Mathematics	12.3	10.4	148	6,955	47
Vocational-Practical Arts	25.3	29.9	111	7,262	67
Fine Arts	5.6	4.5	168	7,229	42
Health and P. E.	9.3	6.8	203	7,353	36
Special Prof. Services	--	9.2	--	8,455	--

There is strong evidence that this analysis of the internal structure of costs of high schools may be helpful to local school leaders in planning, evaluating and interpreting the allocation of resources to secondary education.

To me, this approach or intra-school analysis of costs by program components is more promising than inter-school composite costs. The reason is that schools represent gradations of emphasis among various program components. There is no such thing as a pure vocational school, a technical school, or even an academic school. The "program mix" of schools ranges widely from one extreme to another. The terms "vocational," "technical," "academic", or even "comprehensive" appear to be too imprecise as classifications for measurement of costs.

I have limited measurement to the area of vocational-practical arts which seems to be responsible for most of the extra cost of high schools in the great cities that can be attributed to the composition of the high school population. I think, however, that non-instructional professional services may vary to such an extent that they should be included. I found that these services amounted to 9.2 per cent of all professional salaries in the group of great city high schools. Blake found an average of 23.9 per cent in a sample of suburban high schools around Chicago.

This approach to program analysis in the high school seems to offer a basis for explaining the differences in allocation of resources among schools and school systems for this phase of education. Analyses can be made annually and trends can be interpreted in the light of changes in purposes and practices.

THE THIRD PROJECT:
FURTHER STUDY ON THE STRUCTURE OF EDUCATIONAL COSTS

Thus far these explorations did not yield satisfactory predictive relationships between any breakdown (structure) of costs and characteristics of the school population that presumably are related to organization of programs and deployment of staff and resources. Nor did I find any useful clues to predict anything about costs directly from characteristics of the general population such as measures of density of population, average family income, level of education, distribution of occupational categories, and other variables.

However, the preliminary estimates of extra costs of special programs in the first project and the more intensive analysis of costs of secondary education in the second project indicated that program analysis by functional components is a very promising approach to school costs.

This approach basically resembles the one followed by R. L. Johns and E. L. Morphet in a number of state aid formulas. They have developed procedures which provide an aggregate of cost units for specified programs and services in the distribution of state funds to local school districts. The assumption is that the fiscal needs of an equalized program for school systems can be estimated by setting standards for the major elements of cost. Sargent[1] attempted to express the measure of cost of a foundation program in weighted service units rather than the conventional pupil or classroom units.

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[1] Sargent, Cyril B. "The Relation of Educational Services to State School Fiscal Policy." The Harvard Educational Review. 19:121-123. March 1949.

I have used the term "components of educational programs" to include specified programs of instruction and associated services in functional terms. For example, the component of instruction in present accounting practice is largely non-functional. It fails to delineate among operational entities for which goals, performance of staff, and outcomes can be defined and hopefully measured.

At the outset I have identified eleven components. Some of these I have tried to define a priori as functional. Others are conventional categories of the budget which could not be modified or re-allocated into presumed functional terms.

The first four are components of classroom instruction as follows:

1. Regular instructional programs in elementary schools, including kindergartens.
2. Special instructional programs in elementary schools.
3. Regular instructional programs in secondary schools.
4. Special instructional programs in secondary schools.

Pupils are counted in full-time equivalents in the respective components for which they receive instruction. For example, a fifth grade pupil who spends half of his time in regular classes and half in remedial classes would be counted as half in regular programs and half in the special ones. The distributions of full-time equivalent pupils and teachers are shown in Tables 12 and 13. Table 14 shows the pupil-teacher ratios in the respective components.

The module of cost is the pupil unit which is equated to the average expenditure for teachers' salaries in regular programs of elementary schools. This is the standard for converting the actual number of pupils in the other categories into equivalent weighted pupil cost units. The conversion of all pupils into standard units of equivalent cost is accomplished by first computing the ratio of the average salary expenditure per pupil to the standard. Then the ratio is multiplied by the number of pupils in the respective category.

A summary of expenditures and ratios for each category is shown for eleven cities in Table 15.

Thus the basic structure of educational costs consists of salaries of teachers prorated according to four broad categories of instructional programs and translated into a standard unit amount per pupil. This arrangement makes it possible to express the basic part of costs in terms of pupil units. A summary of cost units is shown in Table 16 for eleven cities. To review what this table means, we see that 50.8 per cent of all teachers' salaries was spent on teachers in elementary schools who worked with pupils in regular classes or instructional programs. Less than half, 42.8 per cent, was spent for salaries of high school teachers in regular programs. The special programs as defined in this study had 3.8 and 2.5 per cents respectively in elementary schools and high schools.

Other operating expenditures could not be prorated in relation to these four categories. Hence, they were related to the total salaries of teachers at the rate of one equivalent weighted pupil unit for each $250 expended. Table 17 shows the distribution of seven other program components in equivalent weighted pupil units and the per cent that each one is of the total number of units for teachers' salaries. For example, the salaries of non-teaching professional staff amounted to 15.84 per cent of teachers' salaries. Payments to staff on leave of absence amounted to only 1.15 per cent. Retirement payments which averaged 16.22 per cent for the group ranged from 7.7 to 27.7 per cent among individual systems. This is an item which seldom is included, except for non-professional staff, in school costs outside of great cities because expenditures are made at the state level through state retirement systems. Thus if costs in one of these cities are being compared with those in a district which does not have a local retirement system, this item would have to be eliminated from consideration or estimates would have to be supplied in the latter.

TABLE 12

DISTRIBUTION OF PUPILS

1962-1963

City	Number of Pupils in Elementary Grades				Number of Pupils in Junior and Senior High Schools				Grand Total
	Total	Regular Programs	Special Programs	Percent Special is of Regular	Total	Regular Programs	Special Programs	Percent Special is of Regular	
Baltimore	103,098	97,090	6,008	6.2%	68,976	63,421	5,555	8.8%	172,074
Boston	51,048	49,109	1,939	4.0	38,492	36,183	2,309	6.4	89,540
Buffalo	--	--	--	--	--	--	--	--	--
Chicago	368,542	358,848	9,694	2.7	115,559	113,120	2,479	2.2	484,141
Cleveland	83,982	81,387	2,595	3.2	52,706	52,162	544	1.0	136,688
Detroit	175,621	167,609	8,012	4.8	101,453	98,221	3,232	3.3	277,074
Houston	122,203	120,892	1,311	1.1	69,138	68,227	911	1.3	191,341
Los Angeles	313,172	300,655	12,517	4.2	226,489	221,682	4,807	2.2	539,661
Milwaukee	63,773	62,265	1,508	2.4	40,607	39,733	874	2.2	104,380
New York	541,066	531,363	9,703	1.8	461,295	435,825	25,470	5.8	1,002,361
Philadelphia	136,954	132,115	4,839	3.7	117,662	112,067	5,595	5.0	254,616
Pittsburgh	43,512	42,053	1,459	3.5	28,266	27,700	566	2.0	71,778
St. Louis	--	--	--	--	--	--	--	--	--
Average				3.5%				4.0%	

Note: Pupils are counted in full-time equivalents.

TABLE 13

DISTRIBUTION OF TEACHERS

1962-1963

City	Number of Teachers in Elementary Grades				Number of Teachers in Junior and Senior High Schools				Grand Total
	Total	Regular Programs	Special Programs	Percent Special is of Regular	Total	Regular Programs	Special Programs	Percent Special is of Regular	
Baltimore	3,413	3,108	305	9.8%	2,870	2,609	261	10.0%	6,283
Boston	1,964	1,818	146	8.0	1,637	1,437	200	13.9	3,601
Buffalo	--	--	--	--	--	--	--	--	--
Chicago	12,729	11,911	818	6.9	4,885	4,690	195	4.2	17,614
Cleveland	2,812	2,627	185	7.0	2,106	2,062	44	2.1	4,918
Detroit	5,789	5,212	577	11.0	4,367	4,123	244	5.9	10,156
Houston	4,321	4,117	204	5.0	3,200	3,109	91	2.9	7,521
Los Angeles	10,300	9,414	886	9.4	9,455	9,194	261	2.8	19,755
Milwaukee	2,356	2,146	210	9.8	1,748	1,660	88	5.3	4,104
New York	21,188	20,231	957	4.5	21,195	19,858	1,337	6.7	42,383
Philadelphia	4,405	4,086	319	7.8	4,629	4,258	371	8.7	9,034
Pittsburgh	1,444	1,333	111	8.3	1,083	1,044	39	3.7	2,527
St. Louis	--	--	--	--	--	--	--	--	--
Average				8.0%				5.8%	

TABLE 14

PUPIL-TEACHER RATIOS

1962-1963

City	Elementary Schools			Junior and Senior High Schools		
	Regular Programs	Special Programs	Total	Regular Programs	Special Programs	Total
Baltimore	31.2	19.7	30.2	24.3	21.3	24.0
Boston	27.0	13.3	26.0	25.2	11.5	23.5
Buffalo	--	--	--	--	--	--
Chicago	30.1	11.6	29.0	24.1	12.7	23.7
Cleveland	31.0	14.0	29.9	25.3	12.4	25.0
Detroit	30.0	13.9	30.3	23.8	13.2	23.2
Houston	29.4	6.4	28.3	21.9	10.0	21.6
Los Angeles	31.9	14.1	30.4	24.1	18.4	24.0
Milwaukee	29.0	7.2	27.1	23.9	9.9	23.2
New York	26.3	10.1	25.5	21.9	19.1	21.8
Philadelphia	32.3	15.2	31.1	26.3	15.1	25.4
Pittsburgh	31.5	13.1	30.1	26.5	14.5	26.1
St. Louis	--	--	--	--	--	--
Average	30.2	12.6	28.9	24.3	14.4	23.8

TABLE 15

BASIC COST UNITS

(Average Expenditure per Pupil for Salaries of Teachers)

1962-1963

City (1)	Elementary Schools			Junior and Senior High Schools			
	Regular Programs (2)	Special Programs (3)	Ratio* 1 Col. 3 ÷ Col. 2 (4)	Regular Programs (5)	Special Programs (6)	Ratio* 2 Col. 5 ÷ Col. 2 (7)	Ratio* 3 Col. 6 ÷ Col. 2 (8)
Baltimore	$189	$ 300	1.586	$262	$300	1.389	1.586
Boston	252	414	1.643	283	343	1.123	1.359
Buffalo	--	--	--	--	--	--	--
Chicago	237	615	2.591	303	659	1.278	2.778
Cleveland	202	463	2.289	258	602	1.275	2.975
Detroit	238	483	2.026	295	570	1.237	2.392
Houston	185	1,108	5.995	272	484	1.473	2.621
Los Angeles	237	535	2.261	332	435	1.404	1.839
Milwaukee	232	840	3.615	297	781	1.278	3.359
New York	297	826	2.784	374	458	1.259	1.545
Philadelphia	236	738	3.127	277	580	1.172	2.457
Pittsburgh	213	495	2.319	251	449	1.177	2.107
St. Louis	--	--	--	--	--	--	--
Weighted Average (Obtained by combining totals of all cities)	250	617	2.469	323	462	1.290	1.846

* Average expenditure per elementary pupil (K-6FTE) in regular program = 1.00.

TABLE 16

STRUCTURE OF COSTS FOR EXPENSES OF CURRENT OPERATION

Summary of

Total Basic Pupil Cost Units of Eleven Great Cities

1962-1963

Budgetary Component	Number of Pupils Actual	Number of Weighted Pupil Units*	Ratio (Regular El. pupil = 1.0)	Percent of Basic Component
1. Number of Pupils in Regular Elementary Programs	1,943,386	1,943,386	1.0000	50.825%
2. Number of Pupils in Special Elementary Programs	59,585	147,138	2.4694	3.848
3. Number of Pupils in Regular High School Programs	1,268,341	1,636,548	1.2903	42.800
4. Number of Pupils in Special High School Programs	52,342	96,628	1.8461	2.527
5. Total Number of Basic Weighted Pupil Units	3,323,654	3,823,700	1.1505	100.000

* Average expenditure per elementary pupil (K-6 FTE) in regular programs for salaries of classroom teachers in regular programs equals one weighted pupil unit. In the year 1962-63 the average expenditure per weighted pupil was $250.

TABLE 17

STRUCTURE OF COSTS FOR EXPENSES OF CURRENT OPERATION

Summary of Total Equivalent Weighted Pupil Cost Units
for Operating Expenses in Eleven Great Cities
1962-1963

Budgetary Component	Number of Equivalent Weighted Pupil Units	Percent of Total Basic Weighted Pupil Cost Units
1. Number of Basic Weighted Pupil Cost Units for salaries of classroom teachers in programs of day schools in academic (9-10 mo.) year	3,823,700	100.00%
2. Number of Additional Weighted Pupil Equivalencies for:		
(1) Salaries of non-teaching professional staff on the job	605,626	15.84
(2) Salaries of professional staff on leave of absence	43,968	1.15
(3) Salaries and other expenses for Community Services	99,445	2.60
(4) Retirement payments of professional and non-professional staff	620,233	16.22
(5) Other operating expenses of day schools in regular academic year	2,063,002	53.95
(6) All operating expenses of adult evening programs	57,600	1.50
(7) All operating expenses of summer school	40,820	1.07
(8) Total Number of additional Weighted Pupil Equivalencies	3,530,694	92.33
3. Grand total number of Weighted Pupil Cost Units	7,354,394	192.33
4. Average expenditure per Weighted Pupil Unit	$250	
5. Total of operating budgets	$1,845,735,421	

The seven operating components which back up the teachers amount to 92.33 per cent of expenditures for teachers' salaries. Stated another way, for every dollar spent on teachers' salaries for the academic year, 92 cents were spent on other components. Two of these, adult evening programs and summer schools, are not directly supportive of teachers as are the others. Adult programs are parallel to those for the traditional school-age youth. Summer schools are merely an extension of the school year. I have treated them separately to show the magnitude of these operations in relation to the traditional nine months' scholastic year.

What I have attempted to show has not been accomplished fully for lack of more functional accounting. For example, as our knowledge about the amount of non-teaching professional service which teachers need increases, we should be able to translate the amount into costs. The services of most non-professional staff can be allocated in relation to the basic program components. It does not appear to be feasible to attempt to prorate central office functions. However, these should be clearly defined. Materials of instruction and other tools of the profession likewise must yield to forms of measurement which relate them directly to program components. These materials represent one component of costs for which there is woefully little empirical data for evaluation. If a realistic program of leaves of absence is adopted for the professional staff the costs can be evaluated accordingly. A standard of excellence for this component would probably be something like one year's equivalent leave with full pay for each six years of professional service.

Capital Outlay

One of the most widely held principles in school finance is that state fiscal policies should include provision of adequate funds from state and local sources to every school district for capital outlay.

The preliminary estimates of capital costs in the first project leave no doubt about the necessity for application of this principle in the great cities. The magnitude of needs for replacing obsolete buildings, keeping up with increasing enrollments, and reducing crowded conditions is tremendous. Equally impressive to me is the necessity for flexibility to keep the capital facilities aligned with the requirements of the operating programs. At the moment these cities could not possibly operate the kinds of programs and services that are needed even if they had an ample supply of teachers and funds to pay them. They do not have sufficient amounts of suitable space and facilities for this purpose.

My purpose in studying capital costs in this project is to obtain normative data on school buildings which were constructed in a recent three-year period. These data include distributions of space and cost for three types of schools, elementary, junior high school, and senior high school. Each type is divided further into three categories of size to determine whether or not the effect of size on cost is significant. Distributions of costs and space are shown for some 98 schools in Tables 18 through 23.

TABLE 18

DISTRIBUTION OF BUILDING SPACE

ELEMENTARY SCHOOLS
(Constructed 1961-1963)

Type of Space	Average of 7 Schools — Under 500 Pupils			Average of 25 Schools — 500 - 999 Pupils			Average of 24 Schools — 1000 - 1499 Pupils		
	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.
1. Classroom and Laboratory	8,406	100.0%	20.9	18,904	100.0%	24.0	28,307	100.0%	24.1
a. Classroom space	6,950	82.7	17.3	16,288	86.2	20.7	27,268	96.3	23.2
b. Laboratory space	1,456	17.3	3.6	2,616	13.8	3.3	1,039	3.7	0.9
2. Special Services**	362	4.3	0.9	578	3.1	0.7	1,641	5.8	1.4
3. Library	420	5.0	1.1	877	4.6	1.1	600	2.1	0.5
4. Staff Offices	498	5.9	1.2	942	5.0	1.2	1,321	4.7	1.1
5. Large Mass Activity	3,358	40.0	8.3	5,697	30.1	7.2	9,102	32.2	7.7
a. Cafeteria	971	11.6	2.4	2,771	14.7	3.5	3,128	11.1	2.6
b. Auditorium	336	4.0	0.8	1,441	7.6	1.8	2,084	7.4	1.8
c. Gymnasium	2,051	24.4	5.1	1,485	7.8	1.9	3,890	13.7	3.3
6. Total building space exclusive of general utility (Corridors, lounges, heating, storage, etc.)	13,044	155.2	32.4	26,998	142.8	34.2	40,971	144.8	34.8

* Percent of space for classrooms and laboratories.
** Health, guidance, counseling, etc.

TABLE 19

DISTRIBUTION OF CAPITAL COSTS

ELEMENTARY SCHOOLS
(Constructed 1961-1963)

Components of Cost	Average of 9 Schools Under 500 Pupils			Average of 30 Schools 500 - 999 Pupils			Average of 28 Schools 1000 - 1499 Pupils		
	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil
Total Cost of Plant	$577	143.3%	$1,560	$943	126.4%	$1,202	$1,370	126.3%	$1,167
1. Site and site development	147	36.4	397	156	20.9	199	239	22.1	204
a. Land	122	30.3	330	125	16.8	159	228	21.0	194
b. Demolition	5	1.2	14	6	0.8	8	4	0.4	4
c. Landscaping	20	4.9	53	25	3.3	32	7	0.7	6
2. Building and Furnishings	402	100.0	1,088	746	100.0	951	1,085	100.0	924
a. Construction and utilities	381	94.7	1,030	701	94.0	894	1,050	96.7	894
b. Furnishings for instruction	21	5.3	58	45	6.0	57	35	3.3	30
3. Administrative Costs	28	6.9	75	41	5.5	52	46	4.2	39
a. Architectural fees	21	5.3	57	37	5.0	47	40	3.7	34
b. Legal and others	7	1.6	18	4	0.5	5	6	0.5	5

* Percent of cost of building and furnishings.

TABLE 20

DISTRIBUTION OF BUILDING SPACE

JUNIOR HIGH SCHOOLS
(Constructed 1961-1963)

Type of Space	Average of 5 Schools 500 - 999 Pupils			Average of 4 Schools 1000 - 1499 Pupils			Average of 7 Schools 1500 - 2499 Pupils		
	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.
1. Classroom and Laboratory	28,497	100.0%	34.7	42,834	100.0%	35.7	62,799	100.0%	33.2
a. Classroom space	11,078	38.9	13.5	19,577	45.7	16.3	30,359	48.3	16.0
b. Laboratory space	17,419	61.1	21.2	23,257	54.3	19.4	32,440	51.7	17.2
2. Special Services**	1,334	4.7	1.6	2,093	4.9	1.7	2,439	3.9	1.3
3. Library	2,255	7.9	2.7	2,405	5.6	2.0	2,905	4.6	1.5
4. Staff Offices	2,000	7.0	2.4	2,401	5.6	2.0	4,459	7.1	2.4
5. Large Mass Activity	20,169	70.7	24.6	24,873	58.1	20.8	29,403	46.8	15.6
a. Cafeteria	9,132	32.0	11.1	9,345	21.8	7.8	8,892	14.1	4.7
b. Auditorium	1,768	6.2	2.2	4,177	9.8	3.5	8,987	14.3	4.8
c. Gymnasium	9,269	32.5	11.3	11,351	26.5	9.5	11,524	18.4	6.1
6. Total building space exclusive of general utility (Corridors, lounges, heating, storage, etc.)	54,255	190.3	66.0	74,606	174.2	62.2	102,005	162.4	54.0

* Percent of total space for classrooms and laboratories.
** Health, guidance, counseling, etc.

TABLE 21

DISTRIBUTION OF CAPITAL COSTS

JUNIOR HIGH SCHOOL
(Constructed 1961-1963)

Components of Cost	Average of 5 Schools 500 - 999 Pupils			Average of 4 Schools 1000 - 1499 Pupils			Average of 7 Schools 1500 - 2499 Pupils		
	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil
Total Cost of Plant	$1,898	140.1%	$2,308	$2,556	109.2%	$2,130	$3,652	117.6%	$1,933
1. Site and site development	448	33.1	545	125	5.3	104	409	13.2	217
a. Land	358	26.5	436	72	3.1	60	336	10.8	178
b. Demolition	14	1.0	17	0	0.0	0	0	0.0	0
c. Landscaping	76	5.6	92	53	2.2	44	73	2.4	39
2. Building and Furnishings	1,354	100.0	1,647	2,341	100.0	1,951	3,106	100.0	1,644
a. Construction and utilities	1,254	92.6	1,525	2,173	92.8	1,811	2,823	90.9	1,494
b. Furnishings for instruction	100	7.4	122	168	7.2	140	283	9.1	150
3. Administrative Costs	96	7.0	116	90	3.9	75	137	4.4	72
a. Architectural fees	73	5.3	89	79	3.4	66	123	3.9	65
b. Legal and others	23	1.7	27	11	0.5	9	14	0.5	7

* Percent of cost of building and furnishings.

TABLE 22

DISTRIBUTION OF BUILDING SPACE

SENIOR HIGH SCHOOLS
(Constructed 1961-1963)

Type of Space	Average of 2 Schools 1000 - 1499 Pupils			Average of 5 Schools** 1500 - 2499 Pupils			Average of 6 Schools Above 2500 Pupils		
	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.	Amount of Space: sq.ft.	Percent*	Amount per Pupil: sq.ft.
1. Classroom and Laboratory	46,196	100.0%	35.7	55,048	100.0%	30.8	95,771	100.0%	32.1
a. Classroom space	13,159	28.5	10.2	26,872	48.8	15.0	38,886	40.6	13.0
b. Laboratory space	33,037	71.5	25.5	28,176	51.2	15.8	56,885	59.4	19.1
2. Special Services***	1,197	2.6	0.9	2,412	4.4	1.3	3,679	3.8	1.2
3. Library	1,400	3.0	1.1	1,627	3.0	0.9	4,276	4.5	1.4
4. Staff Offices	2,037	4.4	1.6	3,589	6.5	2.0	6,925	7.2	2.3
5. Large Mass Activity	37,929	82.1	29.3	37,210	67.6	20.8	52,686	55.0	17.7
a. Cafeteria	4,653	10.1	3.6	8,628	15.7	4.8	12,071	12.6	4.1
b. Auditorium	10,583	22.9	8.2	10,896	19.8	6.1	12,316	12.9	4.1
c. Gymnasium	22,693	49.1	17.5	17,686	32.1	9.9	28,299	29.5	9.5
6. Total building space exclusive of general utility (Corridors, lounges, heating, storage, etc.)	88,759	192.1	68.6	99,886	181.5	55.8	163,337	170.5	54.7

* Percent of space for classrooms and laboratories.
** Excluding two Chicago schools for lack of data. Capital costs data are available and are shown in the attached table of Capital Costs.
*** Health, guidance, counseling, etc.

DISTRIBUTION OF CAPITAL COSTS

SENIOR HIGH SCHOOLS
(Constructed 1961-1963)

Components of Cost	Average of 2 Schools 1000 - 1499 Pupils			Average of 7 Schools 1500 - 2499 Pupils			Average of 6 Schools Above 2500 Pupils		
	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil	Total Cost ($000)	Percent*	Cost per Pupil
Total Cost of Plant	$3,576	118.1%	$2,762	$3,684	109.6%	$1,985	$6,376	114.2%	$2,138
1. Site and site development	375	12.4	290	237	7.1	128	468	8.4	157
a. Land	262	8.7	203	156	4.7	84	351	6.3	118
b. Demolition	0	0.0	0	13	0.4	7	0	0.0	0
c. Landscaping	113	3.7	87	68	2.0	37	117	2.1	39
2. Building and Furnishings	3,029	100.0	2,339	3,363	100.0	1,812	5,583	100.0	1,872
a. Construction and utilities	2,763	91.2	2,134	3,164	94.1	1,705	5,164	92.5	1,731
b. Furnishings for instruction	266	8.8	205	199	5.9	107	419	7.5	141
3. Administrative Costs	172	5.7	133	84	2.5	45	325	5.8	109
a. Architectural fees	143	4.7	110	79	2.4	42	298	5.3	100
b. Legal and others	29	1.0	23	5	0.1	3	27	0.5	9

* Percent of cost of building and furnishings.

While this sample is not as complete as desired for all size categories, there are some tendencies worth noting, as follows:

1. The percentage distribution and amounts of space per student differ among types of schools.
2. There is some variation in distribution of space among different sizes of schools of the same type.
3. Small schools cost more per pupil than large ones.
4. The per pupil costs increase progressively from elementary to junior high to senior high school.
5. The total costs of elementary schools range from 126.3 per cent to 143.3 per cent of the cost of buildings and furnishings. Most of the extra expense is due to high cost of site and site development. For junior high school plants the range is from 109.2 to 140.1 per cent, for high schools from 109.6 to 118.1 per cent. These samples are too small to represent average practice but they indicate the nature of information that is being sought.

Summary

The approach of program analysis appears to be promising for development of a functional structure of educational costs. In my judgment some components, particularly salary payments to staff, can be prorated or identified with specific instructional activities and services. I believe that accounting practices can be established to prorate most other expenditures. Thus it is possible to secure combinations of data to test the functionality of new components.

I believe that this approach may be helpful to throw some new light on the nature of educational costs and thus contribute to improvement of fiscal policies at each level of government.